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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

Kenneth W. Marr

Serial No.: 09/277,893

Filed: March 29, 1999

For: SEMICONDUCTOR FUSES,
SEMICONDUCTOR DEVICES
CONTAINING THE SAME, AND
METHODS OF MAKING AN USING THE
SAME

Examiner: P. Brock, II

Group Art Unit: 2815

Attorney Docket No.:3543US (97-952)

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REPLY BRIEF

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Attention: Board of Patent Appeals and Interferences

Sirs:

This brief, which is in reply to the Examiner's Answer mailed by the Patent Office on
March 12, 2003, is submitted in TRIPLICATE. 37 C.F.R. § 1.193(b).

(8) ARGUMENT

(A) through (C)

The Examiner's Answer does not provide any response to Appellant's position, as stated in the Brief on Appeal, as to why the objections to the drawings and specification should be reversed.

(D) Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 17-33, 50-72, and 74-101 stand rejected under 35 U.S.C. § 112, first paragraph, as lacking support in the originally-filed specification. The Examiner's Answer inappropriately limits the description relevant to such an inquiry to that which refers to FIG. 4. The disclosure of the as-filed specification is not limited to the subject matter depicted in the drawings. *See, e.g.*, M.P.E.P. § 2163. A proper inquiry would involve a review of the as-filed specification as a whole. M.P.E.P. § 2163. When the as-filed specification is considered in its entirety, it is clear that the process order depicted in the FIGURES is not limiting. *See, e.g.*, Specification, page 13, lines 14-17.

The law that has been cited in the Examiner's Answer with respect to the issue of whether or not the as-filed specification provides support for the subject matter recited in the claims of the above-referenced application is not factually on point. In *TurboCare Div. of Demag Turbomachinery Corp. v. General Electric Co.*, 60 USPQ 2d 1017 (Fed. Cir. 2001), there was absolutely no reason to believe that the originally filed specification provided basis for the language recited in the claims. The originally-filed specification was completely devoid of any indication that the recited element (springs) could be positioned in the recited location.

The Examiner's Answer, at page 22, correctly provides that "the missing descriptive matter must necessarily be present in the [original] application's specification such that one skilled in the art would recognize such a disclosure." As will be shown, the specification and claims of the above-referenced application comply with this requirement.

With this law in mind, it is notable that the exact language recited in the claims need not be found verbatim in the originally-filed specification to be supported by the originally-filed specification. M.P.E.P. § 2173.05(f) (which applies to 35 U.S.C. § 112, second paragraph, indefiniteness rejections, provides "[t]here is no requirement that the words in the claim must match those used in the specification disclosure.").

It is respectfully submitted that one skilled in the art would have been able to recognize, from the as-filed specification, each and every element recited in the claims of the above-referenced application. In particular, one skilled in the art would have recognized, from the as-filed specification, that a first conductive layer could be patterned to form "laterally discrete spaced apart regions . . . around and between which an underlying insulative structure is exposed." To reiterate, page 4, line 27, to page 5, line 1, of the originally-filed specification provides that polysilicon, which underlies or forms the lower layer of terminal regions of the inventive fuse, "is disposed on the insulative structure in discrete regions or portions that are substantially isolated from one another." It is respectfully submitted that one of ordinary skill in the art would readily recognize that this statement means that laterally discrete, spaced apart regions could be formed from the polysilicon layer prior to the application of another, metal silicide layer thereover.

In fact, the Examiner appears to have acknowledged that "such an embodiment may have been obvious . . ." Examiner's Answer, page 22. Instead, the Examiner asserts that it would not

be inherent for an insulative structure to be exposed around and between the laterally discrete spaced apart regions of conductive material.

In this regard, the as-filed specification of the above-referenced application describes and the drawings of the above-referenced application illustrate an insulative structure beneath the first layer of conductive material. *See, e.g.*, the left side of FIGs. 3 through 8, which depict the fuse and the various elements thereof as being formed on a layer 12 of dielectric material. Alternatively, the fuse could be formed directly on a field oxide region 4. The as-filed specification does not, however, describe that the described fuse may be fabricated over anything other than an insulative structure. It would, therefore, be inherent that when the first layer of conductive material is patterned to form laterally discrete spaced apart regions, an underlying insulative structure would be exposed around and between the laterally discrete spaced apart regions.

For these reasons, as well as the other reasons that have been provided in the Brief on Appeal, it is respectfully submitted that subject matter recited in each of claims 17-33, 50-72, and 74-101 has basis in the originally-filed specification. It is, therefore, respectfully submitted that each of claims 17-33, 50-72, and 74-101 complies with the written description requirement of 35 U.S.C. § 112, first paragraph, and requested that the 35 U.S.C. § 112, first paragraph, rejections of claims 17-33, 50-72, and 74-101 be reversed.

(E) Rejections Under 35 U.S.C. § 103(a)

The Examiner's Answer indicates that *but for* the fact that the fuse of Fischer includes different materials than those recited in the claims of the above-referenced application, Fischer would be an anticipatory reference. Examiner's Answer, page 23. Unfortunately, Fischer is not

an anticipatory reference because it does not teach a process for forming a fuse which includes formation of material layers of the types recited in the pending claims.

The Examiner has attempted to overcome this deficiency in Fischer by substituting teachings from Chen, which describes a fuse that includes a single metal silicide layer. The fact that the claims of the above-referenced application are drawn to methods for fabricating fuses that include two-layer (a metal or polysilicon layer and a metal silicide layer) terminals and a central or fusible region that comprises metal silicide, a combination of structure and materials which may provide some benefits and advantages over both the fuses of Fischer and Chen, has been overlooked.

Rather, based on the assertions that have been made in the Examiner's Answer, it appears that the Examiner has done nothing more than conduct an impermissible hindsight reconstruction, locating and relying upon Fischer for the fuse structure taught therein, and relying upon Chen for its teaching that metal silicide may be used in a fuse. In so doing, the Examiner has asserted that merely by teaching a metal silicide fuse, Chen would have motivated one of ordinary skill in the art to use metal silicide as one of the layers in the fuse of Fischer. There is no logic in that assertion, as Fischer does not provide one of ordinary skill in the art with any motivation to form a fuse with a different material than those that are taught therein and Chen does not include any suggestion which would have motivated one of ordinary skill in the art to use metal silicide in a fuse that includes two-layer terminals and a single-layer central or fusible region.

Turning now to the Examiner's answer to Appellant's explanation of why one of ordinary skill in the art would have no reason to substitute metal silicide for any of the materials that are listed in Fischer, the Examiner has failed to provide any support for his assertion, at page 25 of

the Examiner's Answer, that the use of metal silicide in a fuse fabrication method merely comprises "[s]election from among available materials of one material thought more suitable for a particular use . . ." In particular, none of the references which has been relied upon by the Office indicates that metal silicide would have been useful in fabricating a fuse having the structure taught in Fischer.

Moreover, the Examiner's reliance upon *Martin-Marietta Corp. v. U.S.*, 153 USPQ 206, 373 FR.2d, 972, 976 (Ct. Cl. 1967), for the assertion that one of ordinary skill in the art would have been motivated to use metal silicide in place of one of the material layers in the fuse of Fischer when such a material became available is misplaced, as metal silicides were known to be useful in semiconductor device fabrication processes long before the earliest priority date to which Fischer may claim benefit. *See, e.g.,* Sandhu, col. 1, line 12, to col. 2, line 26. Nonetheless, the fact remains that Fischer lacks any suggestion that such materials would have been useful in fabricating the fuse taught therein.

The Examiner's attack on Appellant's position regarding the language actually recited in the claims, as fully supported by the as-filed specification for the reasons provided above, is not understood.

In any event, the Examiner has argued, repeatedly throughout prosecution of the above-referenced application and again at page 28 of the Examiner's Answer, that the mere formation of a square window in a layer of conductive material creates two regions in that layer that are spaced apart and laterally discrete from one another. This assertion contradicts logic. Any regions of that conductive layer of Fischer, which could only be arbitrarily defined, could not be laterally discrete from one another since the layer continues to include a single structure

with apertures formed therethrough, and any such arbitrarily defined regions would remain connected to one another by other regions of that layer.

The Examiner's Answer, at pages 28 and 29, acknowledges that Chen lacks any teaching or suggestion of forming laterally discrete, spaced apart regions from a first layer of conductive material prior to disposing a layer of metal silicide thereover, as is required by independent claims 17, 50, and 71 of the above-referenced application.

All of the remaining 35 U.S.C. § 103(a) rejections that have been presented and maintained in the above-referenced application rely upon the two above-described flawed premises: (1) that one of ordinary skill in the art would have been motivated to combine the teachings of Fischer and Chen in the manner that has been asserted; and (2) that Fischer teaches or suggests a fuse fabrication method which includes forming laterally discrete, spaced apart regions from a layer of conductive material, the disposing a layer of metal silicide thereover.

As indicated throughout the remainder of the Examiner's Answer, none of the remaining references which have been cited provides any additional motivation to one of ordinary skill in the art to remedy the deficiencies in the asserted combination of Fischer and Chen. *See, e.g.*, Examiner's Answer, page 30 (Mitani), pages 33 & 34 (Sandhu), page 36 (Degelormo), page 37 (Sandhu), and pages 38 & 39 (Ukeda). Nor does any of these additional references teach or suggest "laterally discrete spaced apart regions" or laterally discrete spaced apart regions between and around which an insulative structure is exposed, teachings which are also missing from Fischer and Chen.

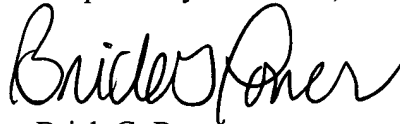
Therefore, none of the additionally cited references remedies the deficiencies that have been identified herein and in the Brief on Appeal with respect to the asserted combination of teachings from Fischer and Chen.

In view of the foregoing, as well as in view of the reasoning that is provided in the Brief on Appeal, it is respectfully requested each of the 35 U.S.C. § 103(a) rejections that has been presented in the above-referenced application be reversed.

CONCLUSION

Reversal of the rejections of claims 17-33, 50-72, and 74-101 is respectfully requested, as is the allowance of each of these claims.

Respectfully submitted,



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